

Claims

What is claimed is:

5 1. A circuit, comprising:

a first operation unit operably coupled to receive a first set of operands, wherein
the first operation unit combines the first set of operands to produce a first operation
result, wherein subsequent to receipt of the first set of operands, the first operation unit
10 receives a second set of operands and combines the second set of operands to produce a
second operation result;

15 a pre-accumulation register operably coupled to the first operation unit, wherein
the pre-accumulation register stores the first operation result to produce a buffered first
operation result;

20 a second operation unit operably coupled to receive a third set of operands,
wherein the second operation unit combines the third set of operands to produce a third
operation result, wherein a first operand of the third set of operands is the second
operation result;

memory operably coupled to the second operation unit, wherein the memory
stores the third operation result in one of a plurality of memory locations; and

25 a selection block operably coupled to the memory, the second operation unit, the
pre-accumulation register, and the first operation unit, wherein the selection block selects
a second operand of the third set of operands from a set of potential operands, wherein
the set of potential operands includes the second operation result, the buffered first
operation result stored in the pre-accumulation register, and data stored in at least one of
30 the plurality of memory locations of the memory, wherein the selection block selects the

second operand of the third set of operands based on operand selection information included in an operational code received by the circuit.

5 2. The circuit of claim 1, wherein the selection block is operably coupled to receive at least one additional operand, wherein the at least one additional operand is included in the set of potential operands.

10 3. The circuit of claim 1 further comprises accumulation buffer operably coupled to the second operation unit and the selection block, wherein the accumulation buffer stores the third operation result to produce a buffered third operation result, wherein the buffered third operation result is included in the set of potential operands.

15 4. The circuit of claim 1, wherein the first operation unit is a multiplier.

5. The circuit of claim 4, wherein the second operation unit is an adder.

6. A circuit, comprising:

a first operation unit operably coupled to receive a first set of operands, wherein
the first operation unit combines the first set of operands to produce a first operation
5 result, wherein subsequent to receipt of the first set of operands, the first operation unit
receives a second set of operands and combines the second set of operands to produce a
second operation result;

10 a plurality of pre-accumulation registers operably coupled to the first operation
unit, wherein each pre-accumulation register of the plurality of pre-accumulation
registers corresponds to a different thread of a plurality of threads,

15 wherein when the first operation result produced by the first operation unit is a
result of an operation for a selected thread of the plurality of threads, a pre-accumulation
register that corresponds to the selected thread stores the first operation result to produce
a buffered first operation result corresponding to the selected thread;

20 a second operation unit operably coupled to receive a third set of operands,
wherein the second operation unit combines the third set of operands to produce a third
operation result, wherein a first operand of the third set of operands is the second
operation result;

memory operably coupled to the second operation unit, wherein the memory
stores the third operation result in one of a plurality of memory locations; and

25 a selection block operably coupled to the memory, the second operation unit, the
plurality of pre-accumulation registers, and the first operation unit, wherein the selection
block selects a second operand of the third set of operands from a set of potential
operands, wherein the set of potential operands includes the second operation result, the
buffered first operation result stored in the plurality of pre-accumulation registers,
30 additional buffered results stored in the plurality of pre-accumulation registers, and data
stored in at least one of the plurality of memory locations of the memory, wherein the

selection block selects the second operand of the third set of operands based on operand selection information included in an operational code received by the circuit.

7. The circuit of claim 6, wherein the selection block is operably coupled to receive
5 at least one additional operand, wherein the at least one additional operand is included in
the set of potential operands.
8. The circuit of claim 6 further comprises an accumulation buffer operably coupled
to the second operation unit and the selection block, wherein the accumulation buffer
10 stores the third operation result to produce a buffered third operation result, wherein the
buffered third operation result is included in the set of potential operands.
9. The circuit of claim 6, wherein the first operation unit is a multiplier.
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10. The circuit of claim 9, wherein the second operation unit is an adder.
11. The circuit of claim 6, wherein the first operation unit receives a fourth set of
operands, wherein the first operation unit combines the fourth set of operands to produce
a fourth operation result, wherein the first operation unit combines the fourth set of
20 operands subsequent to combining the first set of operands and prior to combining the
second set of operands.

12. A method for executing operation codes in a computation block, comprising:

receiving a first set of operands during a first cycle;

5 combining the first set of operands using a first operation unit during the first cycle to produce a first operation result;

storing the first operation result in a pre-accumulation buffer during a second cycle to produce a buffered first operation result;

10 receiving a second set of operands during the second cycle;

combining the second set of operands using the first operation unit during the second cycle to produce a second operation result;

15 selecting a first operand of a third set of operands from a set of potential operands that includes the buffered first operation result, wherein selecting the first operand of the third set of operands occurs during a third cycle, wherein selecting the first operand of the third set of operands is based on a current operation code; and

20 combining the second operation result and the buffered first operation result using a second operation unit during the third cycle to produce a third operation result.

13. The method of claim 12 further comprises storing the third operation result in a
25 memory during a fourth cycle, wherein the set of potential operands includes previously determined operation results stored in the memory.

14. The method of claim 12, wherein storing the first operation result further comprises storing the first operation result in a pre-accumulation buffer of a plurality of
30 pre-accumulation buffers, wherein the pre-accumulation buffer is selected based on a thread of a plurality of threads to which the current operation code corresponds, wherein

the set of potential operands includes previously buffered results stored in each of the plurality of pre-accumulation buffers.